How to author MPEG-2 to AVCHD on DVD5 using Ulead DVD MovieFactory 6+ with HD pack without re-encoding MPEG-2 to AVC.

The Idea

After I bought MF6+ I was playing with authoring Blu-ray project using short HDV .m2t MPEG-2 video file captured from my Sony HDR-HC1 camcorder. Video stream was original, I only re-encoded MPEG audio steam into pseudo 5.1 surround AC3 audio using Vegas because Blu-ray specs don't support MPEG audio. Then I muxed .MPEG-2 and .ac3 files back to new .m2t file. Project was burned to hard disk first, then to BD-RE disk using Nero and played great on PS3.

Later I decided to see how AVCHD authoring works in MF6+. I used the same .m2t file to author AVCHD project with menus and chapters. MF6+ re-encoded video to AVC and burned project directly to DVD+RW disk (it doesn't allow to burn AVCHD project to hard disk). Disk played great on PS3, and AVC quality was good, but I was able to see little degradation compare to HDV MPEG-2. Then I copied the whole BDMV folder from DVD+RW to hard disk just in case.

So, I had two, BLURAY and AVCHD, folders on my hard disk with two finished projects authored with Ulead with identical video in the STREAM folders, one was MPEG-2, another one AVC. Later I decided to see and analyse what was different in those files in those directories using **BDEdit**. **BDMV** tab looked identical to me without going deep into different fields and parameters. Then I found differences under **PLAYLIST** tab and under **CLIPINF** tab between the projects.

00000.mpls file from **PLAYLIST** folder and **00000.clpi** file from **CLIPINF** folder from each project had different data. They were showing information about **00000.m2ts** files in their **STREAM** folders. AVCHD project had AVC video; BLURAY project had MPEG-2 video.

Then I had a thought: what if?..

I replaced three files in AVCHD project with the same files from BLURAY project, burned AVCHD project to DVD+RW.

And it played on PS3 as AVCHD disk with my HDV MPEG-2 video with menus and chapters!!!
That was actually a bit of surprise because I didn't expect this to work.

Those files are:

00000.mpls file from **PLAYLIST** folder, **00000.clpi** file from **CLIPINF** folder, **00000.m2ts** files in their **STREAM** folder

So it looks now like it is possible to author MPEG-2 video on AVCHD DVD5/9 disk, which officially is not supported by Blu-ray specs.

But someone might say that this will be waste of time to do this double authoring: encoding MPEG-2 to AVC and then wasting AVC encode by replacing it with original MPEG-2 file. Besides it takes a long time to encode MPEG-2 to AVC. You might just use that AVC encoded video and the whole AVCHD project.

But I came up with other ideas how to speed up this process of double authoring without re-encoding your MPEG-2 file.

This process described in the following sections.

Dummy AVC files

When playing with Blu-ray and AVCHD projects using my HDV file I saw how long it takes to encode MPEG-2 to AVC. I began thinking of how to eliminate this. Then I thought what if I create dummy AVC files, that match parameters of MPEG-2 files, so I can reuse those dummies every time when I author AVCHD project.
There are five types of MPEG-2 files that you may have in your possession:

1. **TS** - Video 1920x1080, UFF, 19 Mbps Max VBR; Audio – DD, 384 kbps, 3/2 (5.1 surround)
2. **TS** - Video 1920x1080, UFF, 19 Mbps Max VBR; Audio – DD, 384 kbps, 2/0 (stereo)
3. **TS** - Video 1920x1080, LFF, 19 Mbps Max VBR; Audio – DD, 384 kbps, 3/2 (5.1 surround)
4. **TS** - Video 1920x1080, LFF, 19 Mbps Max VBR; Audio – DD, 384 kbps, 2/0 (stereo)
5. **HDV** - Video: 1440x1080, UFF, 25 Mbps CBR; Audio – MPEG Audio Layer 2, 384 kbps, 2/0 (stereo)

Note: **UFF**: Upper Field First; **LFF**: Lower Field First.

Most MPEG-2 TS files from broadcast are of type 1 and 2. I have at least one file that is type 3. People who have HDV camcorders have HDV files of type 5. And I didn't come across of type 4 so far. I think types 3 and 4 with **LFF** are rare.

This is how I created dummy AVC files.

I used Paint Shop Pro X to create two images, one 1920x1080, another one 1440x1080, using standard solid blue color #0000ff.

Then I loaded 1920x1080 image into Vegas 7 and stretched it to 2 hours. Then loaded some audio file and stretched it to 2 hours to match length of the video track. I set project's video properties to **HD 1080-60i (1920x1080, 29.970 fps) Upper Field First**, and audio properties to **5.1 surround**.

Vegas 7 doesn't have real AVC encoder plug-in, so I encoded my project to MPEG-2. I used **Blu-print 1080-60i, UFF** template to encode video track to .M2V elementary stream, and **AC3 3/2 384 kbps** template to encode audio to .AC3 elementary stream. Then I used Womble MVW to mux elementary streams to TS file. So I got two hour long MPEG-2 TS file: **TS-1920-5.1-UFF-2H.ts**. I used the same process with 1440x1080 image to created one hour HDV file: **HDV-1440-5.1-UFF-1H.m2t**.

Then I used MF6+ AVCHD project and just exported clips to AVC files.

Finally, I got two dummy files with AVC encode that would match parameters of my MPEG-2 files:
AVC-1920-5.1-UFF-2H.m2ts and **AVC-1440-5.1-UFF-1H.m2ts**. The first 1920x1080 2 hour file came up 524 MB in file size, and second one 1440x1080 1 hour file came up just 260 MB in size.

And that was it with encoding. Ulead was not doing any re-encoding of those dummy AVC files during AVCHD authoring process. And I can re-use these dummies every time I need to author MPEG-2 TS or HDV video to AVCHD on DVD5.

If you don't have all tools and can't create these dummy AVC files like I did, you probably can load your actual TS video file into MF6+ and re-encode it to AVC and then use it as dummy.

Note, that MF6+ doesn't allow to burn AVCHD project to hard disk, only directly to DVD-+R/RW. You probably don't want to waste double layer DVD+-Rs for temporary burned project. In this case you will need to split large TS files in 4GB chunks to fit on DVD5. You can use HDTVtoMPEG, TSSplitter, Null Packet Saver to do that.

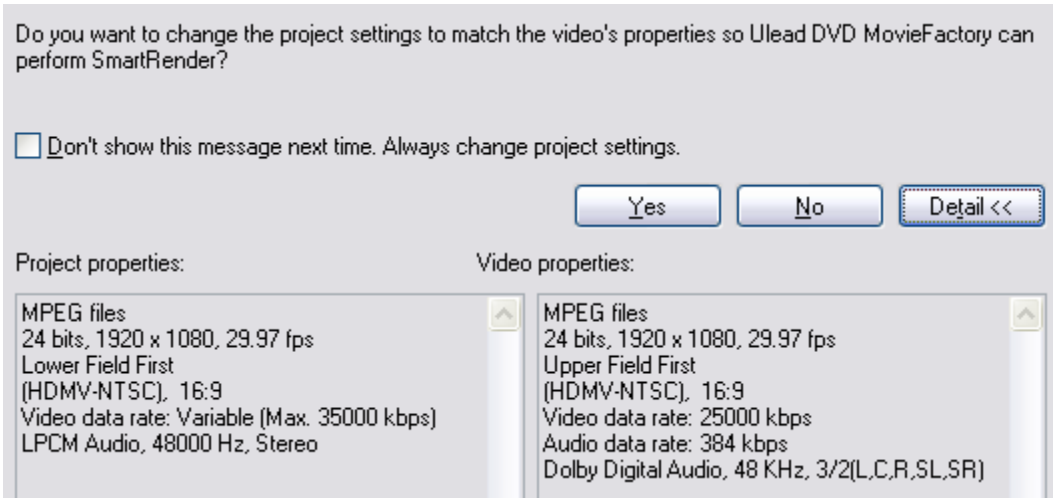
Authoring

Blu-ray project

Start MF6+. Select **Blu-ray Standard** radio button, click **Next**. In the lower left corner click this icon and select **Disk Template Manager**… It will open new window where you can see default Blu-ray template settings:
TV system: NTSC; Disk type: Blu-ray standard; Available disc templates: HDVM-1920; Properties: MPEG files, 24 bits, 1920 x 1080, 29.97 fps, Lower Field First, (HDMV-NTSC), 16:9, Video data rate: Variable (Max. 35000 kbps), LPCM Audio, 48000 Hz, Stereo.
Keep it like that. This way MF6+ will prompt you to change parameters to match your TS video file properties.

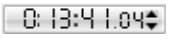
Click this icon and make sure that

check box is selected. Now load your MPEG-2 TS file. Ulead will prompt you with this window:


Do you want to change the project settings to match the video's properties so Ulead DVD MovieFactory can perform SmartRender?
Don't show this message next time. Always change project settings.
Yes
No
Detail <<
Project properties:
MPEG files
24 bits, 1920 x 1080, 29.97 fps
Lower Field First
(HDMV-NTSC), 16:9
Video data rate: Variable (Max. 35000 kbps)
LPCM Audio, 48000 Hz, Stereo
Video properties:
MPEG files
24 bits, 1920 x 1080, 29.97 fps
Upper Field First
(HDMV-NTSC), 16:9
Video data rate: 25000 kbps
Audio data rate: 384 kbps
Dolby Digital Audio, 48 KHz, 3/2(L,C,R,SL,SR)

Don't check that check box that says: **Don't show this message next time**.
This way you will see properties of you TS file every time you load it into Ulead, and you will know what dummy AVC file to use for AVCHD project.

Click **YES** button.

After you loaded you TS file click this button to go to the last video frame.
Write down timecode from this box  on a piece of paper.
In my case with my test file it was **0 hours : 13 minutes : 41 seconds : 4 frames**. You will need this later during AVCHD project. Now click **Add/Edit Chapter** icon, click **Auto Add Chapters** icon, set interval for 3, 4, or 5 minutes (whatever you like) and click **OK** button to generate chapters. Click **Next** button to go to Menu features screen.

On the **Gallery** tab select basic menu template without thumbnails, like **06_BDType1_07** for the Main Menu. Then select chapters menu from the drop-down list and apply the same template. Click **Edit** tab.

Here I would suggest you to delete music track for this menu, uncheck **Motion Menu** check box. **Moving path** and **Menu In** feature will be disabled after this. Set **Menu Out** to None. Do the same for the chapters menu. This will speed up the final stage of the burning process. Also, while you here, you can customize your menu in terms of **Navigation Buttons** and **Layout** and add this to **Favorites**. When authoring AVCHD project **Customize** icon is not available, but you can select that custom template that you saved during Blu-ray project. Click **Next** button to go to the burning screen.

On this screen uncheck **Create to disc** box; uncheck **Archive images of slideshows** box, check **Create Blu-ray folders** box. Click folder icon and select some folder on your hard disk. Then click **Burn** button. That's it for Blu-ray project.

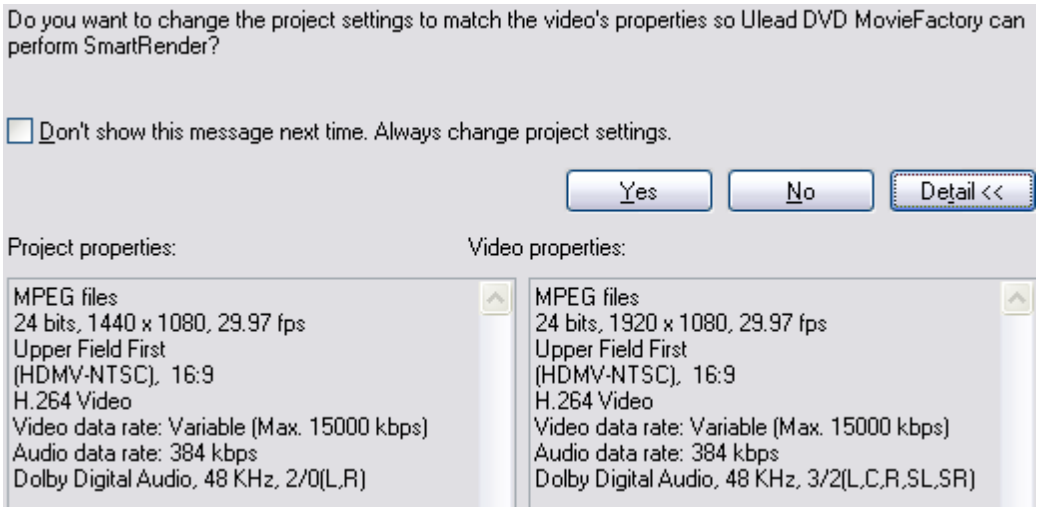
Ulead will re-multiplex video and audio without re-encoding, will render your menus very quickly (because they are static images), and write all folders and files to the folder on hard disk.

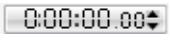
AVCHD project

Start MF6+. Select **AVCHD** radio button, click **Next** button. Make sure that **AVCHD 4.7G** is selected. If you have TS file that will fit on DVD9, and you are willing to waste one blank double layer +-R disk, then select **AVCHD 8.5G** from the pop-up list.

If you click Project settings icon you will see default AVCHD template:
MPEG files, 24 bits, 1440 x 1080, 29.97 fps, Upper Field First, (HDMV-NTSC), 16:9, H.264 Video,
Video data rate: Variable (Max. 15000 kbps), Audio data rate: 384 kbps, Dolby Digital Audio, 48 KHz, 2/0(L,R).
Don't change it.

Now, load your dummy AVC file that matches parameters of you real MPEG-2 TS file. Ulead will prompt you with this screen:


Do you want to change the project settings to match the video's properties so Ulead DVD MovieFactory can perform SmartRender?
Don't show this message next time. Always change project settings.
Yes
No
Detail <<
Project properties:
MPEG files
24 bits, 1440 x 1080, 29.97 fps
Upper Field First
(HDMV-NTSC), 16:9
H.264 Video
Video data rate: Variable (Max. 15000 kbps)
Audio data rate: 384 kbps
Dolby Digital Audio, 48 KHz, 2/0(L,R)
Video properties:
MPEG files
24 bits, 1920 x 1080, 29.97 fps
Upper Field First
(HDMV-NTSC), 16:9
H.264 Video
Video data rate: Variable (Max. 15000 kbps)
Audio data rate: 384 kbps
Dolby Digital Audio, 48 KHz, 3/2(L,C,R,SL,SR)
Click **YES** button.

Now click on timecode box: 

, type that timecode that you wrote down on a piece of paper during Blu-ray authoring (in my case it was **0 hours : 13 minutes : 41 seconds : 4 frames**), and hit **Enter** key on your keyboard. The **Jog Bar**: will jump to that timecode position. Now click right trim button to trim the video and match the length of the dummy AVC file to that MPEG-2 TS file. Now click **Add/Edit Chapter** icon, click **Auto Add Chapters** icon, set interval for the same amount of minutes as you did during Blu-ray project and click **OK** button to generate chapters. Click **Next** button to go to Menu features screen.

On the **Gallery** tab select basic menu template without thumbnails, like **06_BDType1_07** for the Main Menu, or that customized template that you saved and added to Favorites during Blu-ray project. Then select chapters menu from the drop-down list and apply the same template. Click **Edit** tab.

Also you can select music, and/or select background image or video for you menus. These menus will be used in the final modified AVCHD project. Click **Next** button to go to the burning screen.

On the burning screen you have only one option available: **Create to disk**. Somehow **Create AVCHD folders** option disabled. Put DVD-+ RW disk into your burner and burn your project.

Ulead will re-multiplex video and audio without re-encoding, will render your menus very quickly (if they are static images), and write all folders and files to DVD+-RW disk.

After burning is done, copy BDMV folder with all subfolders and files back to your hard drive. There is no CERTIFICATES folder on DVD disk when you author AVCHD project.

Swapping files

Now you have two projects on your hard disk: **BLURAY** and **AVCHD**.

You will need to replace following files inside **BDMV** folder of **AVCHD** project with files from **BDMV** folder from **BLURAY** project:

STREAM\00000.m2ts
PLAYLIST\00000.mpls
CLIPINF\00000.clpi

BACKUP\PLAYLIST\00000.mpls
BACKUP\CLIPINF\00000.clpi

Burning updated AVCHD project

Now you can burn your updated AVCHD project with Nero using **DVD-ROM (UDF)** compilation with manual settings for **UDF 2.50** file system.

Conclusion

AVCHD disk with MPEG-2 video created using this process worked on my PS3 with firmware 2.10